

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/000569

International filing date (day/month/year)
17.02.2005

Priority date (day/month/year)
18.02.2004

International Patent Classification (IPC) or both national classification and IPC
B01J31/24, C07C51/14

Applicant
LUCITE INTERNATIONAL UK LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/000569

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/000569

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-9, 12-19, 24
	No: Claims	1, 2, 10, 11, 20-23, 25-37
Inventive step (IS)	Yes: Claims	3-9, 12-19
	No: Claims	1, 2, 10, 11, 20-37
Industrial applicability (IA)	Yes: Claims	1-37
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)
and / or
2. Non-written disclosures (Rules 43bis.1 and 70.9)
see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

The following documents are referred to:

D2: US2002/0045748

D3: WO97/08124

D2 discloses the preparation of 5-cyanovaleric acid or its ester by carbonylation of pentennitrile in presence of a group VIII metal, a bidentate phosphine, arsine or stilbine and an acid like MSA (p. 1, column 2, paragraph [0012] - p.2, column 1, paragraph [0017]). The ratio of the catalyst components of examples 1, 4-9 and A, C and D fall within the range of independent claim 1 (table, page 5-6). The preferred molar ratios are disclosed on p. 3, column 2, paragraph [0041] and p. 4, column 1, paragraph [0043]. The preferred ligands which fall within the range of formula (I) are listed on p. 3, column 1, paragraph [0035].

Therefore, claims 1, 2, 10, 11, 20-23 and 26-37 are not novel over D2 (Art. 33 (3) PCT).

Catalytic systems according to the present invention comprising a ratio of ligand to metal of more than 10:1 or acid to metal of more than 10:1 are not disclosed in the art.

The applicant demonstrates that a high excess of acid improves the turnover numbers (fig. 1/3-3/3). This effect is not rendered obvious from D2.

Therefore, inventive step is acknowledged for claims 3-9(Art. 33 (3) PCT).

Catalytic systems according to the invention comprising ligands bearing ferrocenes or adamantyl or congressyl radicals are not disclosed in the prior art.

D3 discloses hydroformylation reactions in presence of a catalytic systems comprising platinum, a bidentate diaryl phosphine ligand (e.g. ferrocenes; p. 2, l. 19) and an acid. To obtain ratios according to main claim 1 you have to choose from two lists on p. 5, l. 4-8. The specific examples differ from the present application in the lower amount of acid.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB2005/000569

Therefore, D3 is not novelty destroying for claim 14. As the applicant demonstrates that a high excess of acid improves the turnover numbers inventive step can be acknowledged for claims 12-19 (Art. 33 (3) PCT).

Claims 1-37 are industrially applicable (Art. 33 (4) PCT).

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO2004/014834	19/02/2004	04/08/2003	10/08/2002

In the European Phase said document will be conflicting under Art. 53 (3) (4) EPC for claims 1-3; 7, 10, 11 and 20-37.

Re Item VII

Certain defects in the international application

In order to speed up the procedure the attention of the applicant is drawn with regard to the European Phase to the following facts:

1. The impression "incorporated by reference" on p. 85, l. 15/16 is to be deleted.
2. Claims 1, 34 and 36 are independent product claims relating essentially to the same process. In order to satisfy R. 29 (4) EPC claim 34 and 36 should depend on claim 1. The same objection applies for the independent process claims 23, 35 and 37.

Re Item VIII

Certain observations on the international application

Claims 30-33 are not clear in accordance with Art. 6 PCT and have to be deleted.

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International application No.

PCT/GB2005/000569